NOTE

This Microfiche meets the quality requirements of the American National Standard for Microfiche of Documents (ANSI PH5.9-1975). However, because of imperfections in the document from which it was made, it contains images that are illegible or difficult to read. The source document for this microfiche is the best copy that could be obtained prior to filming.

CIS Congressional Information Service Washington, D.C.

The document was prepared under a contract with the Office of Technology Assessment, Congress of the United States, as an input to the assessment of distance learning. The views expressed by the authors are not necessarily those of OTA, the Board, the OTA Advisory Council or individual members there of.

TECHNOLOGIES FOR LEARNING AT A DISTANCE; LOOKING TO THE FUTURE

CHANGING EDUCATIONAL RELATIONSHIPS

Larry G. Patten
Vice Chancellor
Information and Telecommunications Resources
St. Louis Community College

Prepared under contract to the office of
Technology Assessment, Contract # L3-2445.0

J952-57

Education is the exchange or transmission of information between and among individuals in order to impart increased knowledge from one or more parties to other parties. From the first time that people succeeded in transmitting a thought through a series of symbols, we have been on a path of using increasingly sophisticated means of communicating our ideas. Communication has progressed from gestures, to words, to word storage devices and so on up to the sophisticated systems of technology used today. History has proven that those who are in the best position to educate their society will have the best chance to survive and progress. The increasing use of technology in the educational environment then is not a new invention; it has been one of the major users of technology over the decades, and historically, one of the more controversial. That technology will continue to be used in education is reasonably certain. What is not certain is the changes that these technologies will bring to our overall educational environment and more importantly, how educational organizations will react and interact in this new environment of educational technologies. The changes that written documents have brought and the negative reactions to these changes, provides some indication of how barriers can be erected to the use of the newer technologies of computers and transmission systems. Those reactions are not reactions to the technology itself, but to the changes it brings

to our social order and the changes in fundamental relationships that it brings.

Today, more technology for the exchange of knowledge exists than might have been imagined only a few years ago. Entire books can be transmitted over telecommunication systems in a matter of seconds. Computers at each school can be equipped to download textbooks on a regular basis and allow teachers to select sections and assemble textbooks for their specific class, in whatever fashion they feel appropriate to meet their specific educational goals. The ability exists technically for institutions in all areas of the country to provide educational opportunities to any other area or multiple areas. The ability to begin to erase the distinction between higher educational and secondary education and to begin to blur the lines between grade levels and to truly begin to work on the educational needs of the individual regardless of their age, location or socioeconomic level is available now. The disadvantaged and the disenfranchised can be reached through telecommunication systems. On-job-training and literacy training, on a national basis, provided by the best of trainers at lower cost is possible through telecommunications. All these efforts will result in an increase in productivity that will directly impact our competitiveness in the world market. The technology is there, the capability exists; then the question must be raised, why is it not happening, if this is such a national priority?

The question today does not rest in the issue surrounding the technical capabilities. Satellites exist. Fiber optic cables exist. Computers and optical disk systems exit. Cable TV systems exist. It is not even a matter of funds. What impedes progress in our use of these technologies in the educational process is resistance to change, the manner in which the business of education is conducted, the degree to which we are willing to understand the difference between good teaching practices and educational tradition, and our willingness to remove barriers between organizations and to form new partnerships with those who may never have been thought of as part of the educational process.

In 1972, Kirkwood Community College, Cedar Rapids, Iowa considered the possibility of reaching persons who were not able or willing to attend classes or avail themselves of the college services because of various barriers, real or perceived. This group included:

- Persons who could not come to the campus on a regular basis because of the distance they lived from the campus.

- Persons who would not come to the campus because of previous difficulties with the educational process.

- Secondary school students who would like to take advance placement classes but who could not leave the school building to do so.

- Persons who, at their place of work, could take a class, but who were unable to leave their place of work to travel to a remote location to attend classes.

- Persons who have commitments to job, home, and family who cannot therefore come to campus.

When the Kirkwood system was under development it became clear that to be successful, the college would need to form relationships in a variety of areas. Other colleges, secondary schools, business, industry, labor and the telecommunications industry were recognized as potential partners. Partly because of the scale of the project and partly because it was the nature of the college, Kirkwood recognized that the degree to which it could make successful partnerships would also be the degree to which it would be successful overall with the utilization of telecommunications in the process of education. The Kirkwood system was built; the partnerships were formed and today it is a major success and a national model.

In 1986, the General Assembly of the State of Iowa decided that it was important to have some statewide direction to what was obviously a growing area of educational telecommunications. Since the time that the Kirkwood system was started, other community colleges, as well as universities and some secondary schools built educational telecommunication systems or had plans to do so. Therefore, the General Assembly made the decision to develop a long range plan for educational telecommunications. This planning process was begun in December of 1986 and concluded in August of 1987. While the process dealt somewhat with the technology employed, it did so only as a point of clarification in order to provide some base of reference. The importance of all organizations of the state working together was of greatest importance. The most important part of the plan dealt with educational need, organization and necessary relationships. The Iowa plan for educational telecommunication progressed as follows:

- Definition - Even though telecommunication systems had been in use for some time in Iowa, many persons with whom relationships needed to be made did not understand even the basics of the systems being discussed. It was important that

all groups involved have an understanding of the types of systems being discussed and the potential of these systems. Therefore, time was spent in the planning process explaining the functionality of the potential systems. It was also important that people understood that these represented tools that could be employed to disseminate information; not panaceas. Because of the understanding of the importance of education in the global society and because of the crisis in rural education, as well as other critical education issues, many are looking toward technology as the total solution that can solve all those types of existing problems. While they will help, it is also important that everyone understand the limitations and the importance of integration of these systems into the educational process. Fundamentally, those who

might get involved must understand the great potential, the limitations, and the barriers to implementation.

- Educational Need- Once there was an understanding of the systems, it was important to determine if an educationally based need, or set of needs, actually existed that could or should be addressed by the systems that had been described. A set of meetings was held to determine the educational needs that could be met with those systems.

-Organization - Critically important was the establishment of an organization that would take the lead in the development of these systems. One organization must be in the position to explain, to develop and to operate the systems for the common good. On a complex project that covers a large geographic region, it may be necessary to have identified local, regional and/or state wide lead organizations. This organization must

be committed to the system and be willing to share it with others. Typically, a consortium of equal players will not work. Reaching consensus on this type of system is difficult, if not impossible. An understanding must therefore develop among the participating organizations that not everyone must, or should be in the leadership position. Communication among all the organizations was critical at that point since it was easy for institutions to get involved in turf battles. Everyone had to understand that ownership and coordination are not the same as control. There needed to be a clear leader; someone in charge that could provide the necessary decision making that would be required for the success of such a system.

- Relationships - Several levels of relationships were necessary in the development and operation of a successful system of telecommunications. In the planning stage, it was first important that the organization recognized as the leader

have the proper level of commitment to the project. Barriers needed to be removed from this process through changes in legislation and/or internal organizational structure and mission. It was further important that it be clearly understood that organizations outside the lead organization have a role appropriate to the collective whole.

Other relationships beyond the inter-relationship of the various educational institutions were also developed. A relationship was established with the Department of Economic Development in order to insure that business concerns were expressed. The department of Economic Development is typically a number of business people and a staff that clearly understand the importance of education to the future development of the state. Relationships were discussed with the private sector to obtain a direct indication of the willingness to work together. Local

city governments were important partners as these systems were discussed as impacting on the local area. Education of police and fire personnel, as well as city meetings were held with local Chamber of Commerce groups. The citizens in the cities and towns that would be impacted by these systems were also considered important. Town meetings were held with follow-up questionnaires for those who attended, to ascertain the feeling about the use of these techniques in education. Meetings were held with a number of telecommunication companies to ascertain interest and capabilities.

The development of the Iowa Plan dealt with broad categories. It is a plan that will survive and develop an integrated shared system of telecommunications that will serve the educational community in meeting its goals in a variety of ways. The following information will provide some insight into the specific development of these areas and some of the barriers that occurred.

Definition Process

A definition manual was prepared to allow those organizations that would need to be a part of the process to understand with greater detail the systems that would be available for use. Since this process was dealing with telecommunications and not technology in general, it did not deal with the computer aspects of the system. The manual covered all the various systems of telecommunications possible. Included among those covered were ITFS systems, satellite systems, fiber optics systems and microwave systems. The manual also covered the importance of organizational structure and leadership. This manual was shared with the leadership of the General Assembly, the leadership of the educational community, Iowa Public Television, (a state wide public broadcasting organization), and select members of the business community, including the telecommunications industry. Through this process most persons who would be participating in the next section understood at some minimum level the systems that were being discussed as well as the potential and limitations of those systems. They were also aware of the process that had gone on before at the other institutions in the state that had developed systems. Visits were made to existing systems by key individuals. These steps were important to insure that all parties, whether they agreed with the concept or not, at least started from a common point of understanding.

Educational Need

Meetings were held with educators across the state. These groups included presidents and vice presidents of the four year state universities, presidents of the community colleges, administrators from the area educational agencies, superintendents from various school systems, business leaders and agency heads. All these groups discussed problems that they felt could be addressed through systems of telecommunications. Through these discussions, educational needs that could be reasonably addressed by systems of telecommunications were established.

Organization

The next important step was to determine how to best provide for the organization of the resulting system or systems. It was determined that there needed to be local coordination which, in this specific case, could best be established through the 15 area community college districts. Each community college was then visited and discussions were held with the upper level management staff and in some cases their Board of Directors. During this process, each organization was asked to determine if

the concept of educational telecommunications was consistent with and was, or could be, integrated into their mission statement to insure that there would be a willing and eager leader on a local basis. Each community college presented a letter of support indicating their willingness and eagerness to become a leader and coordinator on the local level. Discussions were held with each of the other educational organizations including the state universities, private colleges, secondary schools and area education agencies to insure that they were comfortable with that direction.

It was further determined that if this system was to function in a way to meet the state wide needs it would need coordination at the state level. Iowa Public Television was considered to be the most viable organization to provide that coordination. The Network already had some level of statutory responsibility in that area and this coordination effort appeared to be an extension of existing responsibilities. It was further determined that to insure the proper linkages between the state coordinating body, Iowa Public Television, the local coordinating body, the community colleges and all other users of the system, that a broadly based committee structure be established. The Narrow Cast Advisory Committee was therefore established. Its function was to advise Iowa Public Television on educational telecommunications. Since it was assumed that conflicts between the various organizations would arise naturally from the use of

the system, such as charge back costs, scheduling conflicts, program content issues, proprietary nature of courses and similar areas of disagreement, the committee was structured in such a way as to bring those conflicts to a body of users for resolution. Through this process, it would be possible to deal with these conflicts not in some detached bureaucratic process but in a discussion of peers. The process itself should serve to strengthen the relationships between organizations and break down the barriers that have developed over many years. The committee is also a vehicle of communications back to the respective organizations about issues of importance including funding, legislation, and general operations. It would also advise in areas of budget and technology. The committee is a place to bring differences to the table and to resolve problems among users of the system.

The organization model considered the establishment of a not for profit corporation that would have the benefits of a state agency but actually exist outside of the normal state structure in order to avoid the constraints that impact on a state agency. A modification of this proposal was adopted by the state through the passage of legislation. Through this statutory change, Iowa Public Television was charged with the responsibility of coordinating the educational telecommunications needs in the state, with the responsibility of forming the Narrow Cast Committee and with providing a coordinated operational system.

Relationships

Once the basic structure was established, attention was turned to relationships between organizations in a real sense. The groups that were considered critical were:

Governor's Office
State Legislative Leadership
Iowa Public Television Board
Community College Administration and Boards
University Administration
University Board of Regents
K-12 School Administration and Boards
Instructors At All Levels
Local Community Leaders
Area Educational Agencies
Department of Education
Department of Economic Development
Business Leaders
Telecommunications Company Leadership

While having their own agenda, it was critical that each of these groups focus on the needs of the state from a global educational perspective and that they continue to realize the importance of this system to education in the state and therefore ultimately to their own interest. Numerous meetings were held with each of the groups. Town meetings were held to explain to persons from within the community what was being planned and ways in which it might help the community. Through these grass roots discussions, a spirit of cooperation developed among the organizations that will be critical to going forward.

IMPORTANCE OF RELATIONSHIPS

Central in importance to the Iowa Plan and most likely to any plan that involves the use of telecommunications in the educational process is the evaluation of existing relationships, making changes to those relationships as necessary, and forming new relationships, partnerships and alliances. Because of its importance to the continuing process, it is considered here in greater detail.

Changes in Relationships

K-12 and Higher Education

One of the major problems of education today is the lack of ongoing, constructive dialogue between the various educational

units. School districts at the K-12 level are not planning curriculum with their counterparts in higher education. It has not been necessary before. Each had their separate facilities, their separate missions and all too often a perceived different constituency. However, with the development of a telecommunications systems, a common bond was formed through the shared technical facilities. Now it is possible for the institution of higher education to be teaching directly into the secondary school. It is possible for higher educational institutions to provide teacher in-service directly into the secondary school building. K-12 programs can begin to be used for developmental education, even for those enrolled in college. Telecommunications allow us to become specialists in our own area and to end some of the duplication of resources. The best can be utilized in each area. Think for a moment about a system of education that is not based on grade level but is based on what various units can do best do to achieve the overall educational objectives. If a student is enrolled in the higher educational system that does not have the minimum math requirements, why develop a whole new area within that higher educational institution, why not, through telecommunications, develop a relationship with specialists in the remedial areas from the K-12 schools providing the instruction to the student at the higher education location. However, any of these activities require that the barriers that exist between the function of higher education and secondary education be overcome. The educational

process should be a continuum, not a series of hand-offs. Telecommunications breaks through the barriers of space and time and provides for the release of these required hand-offs that form a barrier to real education. Since telecommunications makes no distinctions between institutions or facilities, more effective working relationships between K-12 and higher education are a critical component of planning for the utilization of telecommunication systems.

Local school districts must also begin to work more closely together. Barriers must be removed from the process of sharing materials and information. Schools on a local level must begin to develop shared programs that can be delivered to each other through locally based telecommunication systems. Barriers must be removed also from the use of distant programs delivered through telecommunications. Local school districts should work more closely with the state departments to change rules and regulations related to certification of instructors who provide coverage in telecommunication classes. However, to hold to tradition that the person in the remote classroom is a certified teacher removes the possibility of the use of telecommunications as a solution. Faculty and faculty associations must begin to take a new look at the role of instructors in the new educational environment. Instructors do not always need to be the disseminators of the information, they must see themselves as the

facilitators. They must be the ones that coordinate the body of knowledge from a variety of sources and assist the student in their use of that information.

Business, Industry and Labor

Education must begin to serve business, industry and labor in more effective ways. Business has been indicating its displeasure with the complexity of dealing with the educational system for some time. A well trained and educated work force is critical to the functioning of their business and therefore it is critical that a positive response be forthcoming from educational institutions. Through telecommunications, it is possible to provide instruction directly into the plant, office and other company or labor location. However, unless education works cooperatively to remove the barriers so that industry can see a cooperative and unified approach to the problem of developing this asset of a knowledgeable work force, the telecommunication system will meet with less than positive results. Each educational organization in an area must decide what strengths they bring to the marketplace of education. In those areas of common interest, educators must determine how cooperatively they can provide a better product. Educational institutions must also be willing to work with organizations outside their geographic area, bringing the course or program into its area through telecommunications. In those cases, the local educational institution may be no more than a facilitator for the program or

course. However, in the long run, this effort will work to the overall advantage of the institutions. If business can easily get its needs met through a cooperative effort of educational institutions in an area, they will welcome and utilize that opportunity. It should not be left to business to develop these cooperative relationships. NTU and the Community College Satellite Networks are two recent developments indicating that the institutions recognize the changes that must be developed through the use of telecommunications. Both of these organizations, by their very existence, show that it is becoming clear that one organization alone can not provide all services, but through cooperative arrangements, each can better serve their constituency. It is time for education to change from a manufacturing system where each unit invents, develops, and delivers the product of education. It must instead become a service organization that analyzes the needs, searches for the best solution and acts as a facilitator to assure that solution to be applied.

The Telecommunications Industry

Educational institutions have historically assumed that the best and least expensive system of telecommunications was a system that the institution owned. This was true prior to deregulation of the telecommunications industry. However, today with the wide variety of companies in the telecommunications marketplace it is becoming more and more attractive to lease

circuits or capacity, or to purchase it in a manner that works to place even more capacity into areas or new capacity and aimed into areas that normally couldn't receive such service. Rather than over-build already existing circuits or build circuits that provide multiple service to a community, institutions, and/or states should explore the possibility of working with telecommunication companies to build a joint facility or lease capacity if it already exists. Eventually, through the interconnection of the telecommunication companies, including cable television companies, regional telephone providers, and common carriers, institutions will be able to reach directly into the homes with a variety of services. It will be important that as educational institutions and states develop telecommunications systems, they work with telecommunication companies in the area to insure that they will be able to interface with this capability. The greatest barrier to this unfortunately are the companies themselves. Because of the high level of competitiveness, companies may not be able to let the process of acquisition go forward without protests. Some companies may protest if a contract is provided to another vendor just to keep the system from going to someone else. These companies must be made to understand that they must be willing to work in a more cooperative fashion. Legislatures may have to allow bids to be taken outside the normal process that is fraught with so many points where protests can be filed. Working cooperatively means

exactly that; that the telecommunications industry must be a willing partner also.

Government

The role of government will need to change at all levels. Local governments, including boards, of education must begin to consider how bringing these telecommunication capabilities will affect the local community. Having a connection for voice, high speed data, and video can greatly enhance the ability to attract industry for many small communities. State legislatures and agencies will need to provide backing and support for these systems. This backing and support will need to be in the form of funding, relaxation of rules and statutes that impede the use of these systems and developing a spirit of cooperation that will pervade all parties. They must create mechanisms that allow for and possibly require the dialogue and cooperative effort among institutions and between the institutions and the private sector components.

The federal government must begin to provide a more proactive role to facility planning and cooperation within and among states. They must however do more than fund systems and programs; they must set up a mechanism that provides for a cooperative effort. Only the federal government can bring together the telecommunication corporations top executives as well as leaders from the states in politics, business and

education to begin to focus on this critical need. That the government continues to ignore this role and simply funds programs in an ad hoc basis is irresponsible. The federal government must form a unit either of government or outside government, such as a blue ribbon panel or a separate endowed non-profit corporation, to deal with this entire issue of education and the application of technology and telecommunication to the process. The cooperation of the units that are required must start at this level. Government at both the state and federal level must examine their rules and regulations related to telecommunications and look for opportunities that would provide regulatory incentives to companies that provide capacity for educational use in the state. In this way, they could both encourage the development of new telecommunications infrastructure and, at the same time enhance the development of educational telecommunication systems. As Congress and the Federal Communications Commission look at changing the process of enforcing the modified final judgement of Judge Green, they should be aware to the great need for telecommunications capacity for educational purposes and look for opportunities that may be available though examination of this entire area of deregulation.

Opportunities and Barriers

Many opportunities exist today to improve the educational process through telecommunications. Some of those benefits are

direct because of the nature of the technology used, and some are less direct because of what telecommunications brings in terms of change. With the opportunities come barriers; barriers that are mostly related to the change portion and not to the technology. The barriers must be conquered, old relationships changed, new relationships formed and a better system of education must evolve. The implementation of telecommunications will demand that change.